



B. Air Transportation Industry Characteristics

IMPLAN Sector 437, Air Transportation, corresponds to Major Group 45 of the Standard Industrial Code (SIC), Transportation by Air. This industry includes establishments engaged in furnishing domestic and foreign transportation by air (scheduled and non-scheduled) and also those operating airports and flying fields and furnishing terminal services. Establishments primarily engaged in performing services that may incidentally use airplanes (e.g. crop dusting and aerial photography) are classified according to the service performed. Groups within the air transportation industry include:

- Air cargo carriers
- Air passenger carriers
- Air taxi services
- Air ambulance services
- Flying charter services
- Airport terminal services
- Hangar operation
- Helicopter carriers
- Sightseeing airplane services
- Air traffic control
- Aircraft cleaning/janitorial services
- Aircraft servicing/repair
- Airports
- Aircraft storage
- Aircraft upholstery
- Airfreight handling
- Airport hangar rental
- Airport leasing
- Flying fields

The local economic data in the IMPLAN database include output, employment, and value added for each industry. Brief descriptions of these characteristics are presented below.

Industry Output – the value of an industry’s total production.

Employment - the number of full-time and part-time workers in each industry.

Value Added - employee compensation, proprietary income, other property-type income and indirect business taxes.

- Employee compensation describes the total payroll costs (including benefits) of each industry.
- Proprietary income consists of payments received by self-employed individuals as income – as reported on Federal tax forms.
- Other property-type income consists of payments for rents, royalties and dividends, as well as corporate profits.
- Indirect business taxes consist of excise taxes, property taxes, fees, licenses, and sales taxes paid by businesses.

Air Transportation industry data for the state, each county, and WSDOT transportation regions are presented in Table 3. In 1998, the air transportation industry in the State of Washington had total employment of 24,075. Total industry output was nearly \$2.6 billion or \$106,603 per worker. Earnings per worker averaged \$44,667.

Table 3.
1998 Study Area Air Transportation Industry Characteristics

Washington State				
State	Industry Employment	Output per Worker	Earnings per Worker	Industry Output (\$Millions)
Washington	24,075	\$106,603	\$44,667	\$2,566.5

Source: MIG, IMPLAN Professional Version 2.0 Social Accounting & Impact Analysis Software, 2nd Edition, June 2000.





The Central Puget Sound Region, lead by King County, accounted for 86% of the State's air transportation industry employment and 90% of the State's air transportation industry output. Both regional output and earnings per worker were slightly higher than the statewide averages. The Eastern Region, lead by Spokane County, accounted for nearly 6% of air transportation industry employment and 4% of industry output. The Northwest, South Central and Olympic regions each accounted for about 2% of the State's air transportation industry employment and from 1% to 2% of total industry output. The North Central and Southwest regions each accounted for 1% of the State's air transportation industry employment and 1% of industry output.

Table 3.
1998 Study Area Air Transportation Industry Characteristics

Central Puget Sound Region				
County	Industry Employment	Output per Worker	Earnings per Worker	Industry Output (\$Millions)
King	18,664	\$110,213	46,391	2,057
Kitsap	188	\$80,606	32,249	15
Pierce	508	\$83,832	33,790	43
Snohomish	1,405	\$131,476	56,548	185
Total	20,765	\$110,738	\$46,642	\$2,299.4
% of State	86.3%	103.9%	104.4%	89.6%

Source: MIG, IMPLAN Professional Version 2.0 Social Accounting & Impact Analysis Software, 2nd Edition, June 2000.

Table 3.
1998 Study Area Air Transportation Industry Characteristics

Eastern Region				
County	Industry Employment	Output per Worker	Earnings per Worker	Industry Output (\$Millions)
Adams	21	\$170,441	\$40,062	\$3.6
Lincoln	3	\$106,760	\$44,740	\$0.4
Pend Oreille	28	\$150,333	\$31,023	\$4.2
Spokane	1,235	\$76,762	\$30,413	\$94.8
Stevens	1	\$119,975	\$51,055	\$0.2
Whitman	71	\$80,517	\$32,206	\$5.8
Total	1,359	\$80,020	\$30,715	\$108.8
% of State	5.6%	75.1%	68.8%	4.2%

Source: MIG, IMPLAN Professional Version 2.0 Social Accounting & Impact Analysis Software, 2nd Edition, June 2000.

Table 3.
1998 Study Area Air Transportation Industry Characteristics

North Central Region				
County	Industry Employment	Output per Worker	Earnings per Worker	Industry Output (\$Millions)
Chelan	95	\$83,734	\$33,743	\$8.0
Douglas	46	\$78,770	\$31,372	\$3.7
Ferry	12	\$156,743	\$33,904	\$1.9
Grant	143	\$98,371	\$40,735	\$14.0
Okanogan	36	\$99,755	\$41,396	\$3.6
Total	332	\$93,727	\$37,262	\$31.2
% of State	1.4%	87.9%	83.4%	1.2%





Table 3.
1998 Study Area Air Transportation Industry Characteristics

Northwest Region				
County	Industry Employment	Output per Worker	Earnings per Worker	Industry Output (\$Millions)
Island	167	\$57,521	\$21,222	\$9.6
San Juan	48	\$61,999	\$23,361	\$3.0
Skagit	156	\$75,044	\$29,592	\$11.7
Whatcom	201	\$90,531	\$36,990	\$18.2
Total	572	\$74,275	\$29,225	\$42.5
% of State	2.4%	69.7%	65.4%	1.7%

Source: MIG, IMPLAN Professional Version 2.0 Social Accounting & Impact Analysis Software, 2nd Edition, June 2000.

Table 3.
1998 Study Area Air Transportation Industry Characteristics

Olympic Region				
County	Industry Employment	Output per Worker	Earnings per Worker	Industry Output (\$Millions)
Clallam	93	\$85,233	\$34,459	\$7.9
Grays Harbor	24	\$124,700	\$53,311	\$3.1
Jefferson	17	\$57,525	\$21,224	\$1.0
Mason	26	\$79,534	\$31,737	\$2.1
Thurston	233	\$90,898	\$37,165	\$21.2
Total	393	\$89,426	\$36,462	\$35.2
% of State	1.6%	83.9%	81.6%	1.4%

Source: MIG, IMPLAN Professional Version 2.0 Social Accounting & Impact Analysis Software, 2nd Edition, June 2000.

Table 3.
1998 Study Area Air Transportation Industry Characteristics

South Central Region				
County	Industry Employment	Output per Worker	Earnings per Worker	Industry Output (\$Millions)
Benton	13	\$68,381	\$26,410	\$0.9
Franklin	169	\$82,862	\$33,327	\$14.0
Kittitas	18	\$75,668	\$29,891	\$1.4
Walla Walla	74	\$86,336	\$34,986	\$6.4
Yakima	182	\$80,687	\$32,287	\$14.7
Total	456	\$81,861	\$32,848	\$37.3
% of State	1.9%	76.8%	73.5%	1.4%

Source: MIG, IMPLAN Professional Version 2.0 Social Accounting & Impact Analysis Software, 2nd Edition, June 2000.





Table 3.
1998 Study Area Air Transportation Industry Characteristics

Southwest Region				
County	Industry Employment	Output per Worker	Earnings per Worker	Industry Output (\$Millions)
Clark	163	\$84,673	\$34,192	\$13.8
Cowlitz	65	\$78,004	\$31,006	\$5.1
Klickitat	4	\$69,166	\$26,785	\$0.3
Lewis	21	\$103,096	\$42,991	\$2.2
Pacific	49	\$164,022	\$37,176	\$8.0
Total	302	\$97,188	\$34,504	\$29.3
% of State	1.3%	91.2%	77.2%	1.1%

Source: MIG, IMPLAN Professional Version 2.0 Social Accounting & Impact Analysis Software, 2nd Edition, June 2000.

III. Regional Economic Impacts

The regional economic impacts of general aviation and commercial service airports in Washington are presented in the following section. The impacts include the direct, indirect and induced impacts generated by airport operations, airport businesses, pilots and visitors.

Direct Economic Impacts - the sum of the initial aviation spending and the spending by direct suppliers to the aviation industry. As aviation expenditures directly enter the economy, they create successive rounds of additional spending, multiplying the initial impacts. For example, businesses from which the aviation industry purchases goods and services in turn purchase goods and services from their suppliers.

Induced Economic Impacts - spending by aviation employees on food, lodging, and other expenses within their community. This spending, which is income for the receiving businesses, is spent again in the local economy, creating a multiplier effect as successive rounds of spending occur.

Indirect Economic Impacts - spending by air travelers in their destination community on accommodations, food, shopping, rental cars, recreation, etc. The businesses that provide these goods and services employ workers, purchase supplies from other businesses, and invest in business improvements.

A. Airport Operators

The following section provides estimates of the economic contribution of the State's 115 general aviation and commercial service airports in terms of total jobs, income and spending. As reported by airport managers and operators, there are a number of activities that generate economic impacts. These include day-to-day operation of the airport, capital expenditures for airport improvements, and spending by air travel visitors. In general, impacts associated with normal airport operations and air travel visitors occur annually and can be considered on-going economic impacts. These economic impacts would be expected to occur each year of airport operation. Capital improvements may occur at less regular or scheduled intervals and are often dependent on the availability of local, state and federal funding. Thus, they can be considered one-time impacts.





Based on the assumptions used in the analysis, airport operations (excluding state-owned airports and Sea-Tac International Airport) totaled just over \$1 billion in 2000. Direct airport activity supported a total of 8,609 jobs, generated \$300.7 million in employee compensation and provided \$1.2 billion in total economic activity throughout the State. Air travel visitor spending (excluding Sea-Tac International Airport) totaled approximately \$1 billion in 2000, and generated approximately \$1.3 billion in total economic activity, supported 20,000 total jobs, and provided \$359 million in total employee compensation. Regularly scheduled aviation events hosted by local airports supported a total of 69 jobs, generated \$1.2 million in employee compensation and provided \$3.6 million in total economic activity. In the year 2000, capital expenditures at local airports supported a total of 1,426 jobs, generated \$42 million in employee compensation and provided \$137.9 million in total economic activity throughout the State.

1. Airport Operations (Excluding FBO's and Aviation-Related Businesses)

A total of 115 airport surveys were sent to airport managers and operators (excluding Sea-Tac International Airport). Of the total, 88 completed surveys or 77% were returned. For those airports for which no completed survey was received, direct airport impacts were estimated based on other state airports with similar based aircraft and operations characteristics. Operations data from the following airports were used as a proxy for airports for which no data were received:

Airport:	As Proxy For:
Apex Airpark	Firstair Field Rosalia Municipal Spanaway
Bremerton National	Grant County
Cle Elum	DeVere Field
Columbia Gorge/The Dalles	Elma Municipal Prosser
Friday Harbor SPB	American Lake SPB Bremerton SPB Eleventh Street Waterway Floathaven SPB Port of Bellingham SPB Roche Harbor SPB Rosario SPB
Ione	Tonasket Municipal
Mansfield	Fly for Fun Goldendale Packwood Port Orchard Poulsbo SPB Willapa Harbor





**Washington State
Department of Transportation
Aviation Division**

Airport:

New Warden

Pru Field

Waterville

Wilbur Municipal

As Proxy For:

Methow Valley

Davenport

Desert Aire
Grand Coulee Dam

Colville Municipal

Day-to-day operations of Washington's general aviation and commercial service airports generate substantial economic activity in local communities throughout the state. The majority of these airports are publicly-owned and provide direct employment, income and spending. These direct spending and employment impacts support additional jobs, spending and income throughout the region and state. The economic impacts associated with airport operations are summarized in Table 4. Estimated job, income and spending impacts are presented for each region and for the state as a whole. All results are in 1998 dollars.

**Table 4.
Estimated Economic Benefits of Airport Operations (Millions \$98)**

Washington State			
	Employee Compensation	Employment	Total Output
Washington State	\$300.7	8,609	\$1,233.8

Excludes Sea-Tac International Airport

Source: MIG, IMLAN Professional Version 2.0 Social Accounting & Impact Analysis Software, 2nd Edition, June 2000.

**Table 4.
Estimated Economic Benefits of Airport Operations (Millions \$98)**

Central Puget Sound Region			
County	Employee Compensation	Employment	Total Output
King*	\$270.5	7,432	\$1,153.9
Kitsap	\$0.3	12	\$0.5
Pierce	\$3.6	173	\$7.4
Snohomish	\$7.2	330	\$20.9
County Total	\$281.6	7,948	\$1,182.7
Region Total	\$281.4	7,924	\$1,181.8

Excludes Sea-Tac International Airport

Source: MIG, IMPLAN Professional Version 2.0 Social Accounting & Impact Analysis Software, 2nd Edition, June 2000.

The Central Puget Sound region (excluding Sea-Tac International Airport) accounted for 96% of total output generated by airport operations within the state. A number of airports contribute substantially to total output within the Central Puget Sound Region, including King County International Airport/Boeing Field, Kenmore Air Harbor, Paine Field, Harvey Field and Tacoma Narrows.





**Table 4.
Estimated Economic Benefits of Airport Operations (Millions \$98)**

Eastern Region			
County	Employee Compensation	Employment	Total Output
Adams+	\$0.05	7	\$0.06
Lincoln	\$0.005	4	\$0.01
Pend Oreille+	\$0.005	1	\$0.003
Spokane	\$11.3	359	\$31.3
Stevens	\$0.0004	0	\$0.005
Whitman	\$0.1	7	\$0.4
County Total	\$11.5	377	\$31.8
Region Total	\$10.5	337	\$29.2

Source: MIG, IMPLAN Professional Version 2.0 Social Accounting & Impact Analysis Software, 2nd Edition, June 2000.

**Table 4.
Estimated Economic Benefits of Airport Operations (Millions \$98)**

North Central Region			
County	Employee Compensation	Employment	Total Output
Chelan	\$0.03	2	\$0.07
Douglas	\$0.4	14	\$0.7
Ferry+	\$0.0004	0	\$0.005
Grant	\$0.5	34	\$0.9
Okanogan	\$0.07	8	\$0.1
County Total	\$0.9	59	\$1.9
Region Total	\$1.0	65	\$2.1

Source: MIG, IMPLAN Professional Version 2.0 Social Accounting & Impact Analysis Software, 2nd Edition, June 2000.

**Table 4.
Estimated Economic Benefits of Airport Operations (Millions \$98)**

Northwest Region			
County	Employee Compensation	Employment	Total Output
Island	\$0.0005	0	\$0.006
San Juan	\$0.3	15	\$0.7
Skagit	\$0.2	13	\$0.5
Whatcom	\$0.9	29	\$2.8
County Total	\$1.4	59	\$4.0
Region Total	\$1.3	54	\$3.8

Source: MIG, IMPLAN Professional Version 2.0 Social Accounting & Impact Analysis Software, 2nd Edition, June 2000.





Table 4.
Estimated Economic Benefits of Airport Operations (Millions \$98)

Olympic Region			
County	Employee Compensation	Employment	Total Output
Clallam	\$0.2	9	\$0.6
Grays Harbor	\$0.08	8	\$0.2
Jefferson	\$0.06	3	\$0.1
Mason	\$0.2	6	\$0.6
Thurston	\$0.3	7	\$0.6
County Total	\$0.8	33	\$2.1
Region Total	\$0.8	34	\$2.2

Source: MIG, IMPLAN Professional Version 2.0 Social Accounting & Impact Analysis Software, 2nd Edition, June 2000.

Table 4.
Estimated Economic Benefits of Airport Operations (Millions \$98)

South Central Region			
County	Employee Compensation	Employment	Total Output
Benton	\$0.1	6	\$0.2
Franklin	\$1.6	48	\$3.6
Kittitas	\$0.6	37	\$0.7
Walla Walla	\$0.7	21	\$1.7
Yakima	\$0.6	25	\$1.2
County Total	\$3.6	137	\$7.3
Region Total	\$3.8	145	\$7.9

Source: MIG, IMPLAN Professional Version 2.0 Social Accounting & Impact Analysis Software, 2nd Edition, June 2000.

Table 4.
Estimated Economic Benefits of Airport Operations (Millions \$98)

Southwest Region			
County	Employee Compensation	Employment	Total Output
Clark	\$0.3	13	\$1.2
Cowlitz	\$0.06	2	\$0.1
Klickitat	\$0.01	2	\$0.01
Lewis	\$0.1	8	\$0.6
Pacific+	\$0.007	2	\$0.009
County Total	\$0.5	28	\$1.9
Region Total	\$0.4	23	\$1.6

Source: MIG, IMPLAN Professional Version 2.0 Social Accounting & Impact Analysis Software, 2nd Edition, June 2000.

A summary of economic impacts by industry for State of Washington airport operations is presented in Table 5. The summary tables show the linkages between the economic impacts of the air transportation industry and other industries within the State or a specific region. To facilitate presentation of the data, IMPLAN's 528 industrial sectors have been aggregated to 11 major sectors, including: Agriculture, Mining, Construction, Manufacturing, Transportation/ Communication/ Public Utilities (TCPU), Trade, Finance/Insurance/Real Estate (FIRE), Services, Government, Institutions and Other.





Table 5.
Estimated Airport Operations Total Economic Impacts by Industry (Percent of Total)

Washington State*				
Industry	IMPLAN Sector	Total Employment	Total Employee Compensation	Total Output
Agriculture	1	0.3%	0.1%	0.3%
Mining	28	0.0%	0.0%	0.0%
Construction	48	0.6%	0.7%	0.6%
Manufacturing	58	0.9%	1.4%	3.6%
TCPU	433	75.1%	75.6%	73.6%
Trade	447	8.8%	6.8%	6.0%
FIRE	456	2.6%	3.0%	5.9%
Services	463	10.9%	11.4%	9.0%
Government	510	0.4%	0.8%	1.0%
Institutions	516	0.3%	0.1%	0.0%
Other	30001	0.0%	0.0%	0.0%

*Excludes Sea-Tac International Airport.

Source: MIG, IMPLAN Professional Version 2.0 Social Accounting & Impact Analysis Software, 2nd Edition, June 2000.

Table 5.
Estimated Airport Operations Economic Impacts by Industry (Percent of Total)

Central Puget Sound Region*				
Industry	IMPLAN Sector	Total Employment	Total Employee Compensation	Total Output
Agriculture	1	0.1%	0.1%	0.1%
Mining	28	0.0%	0.0%	0.0%
Construction	48	0.5%	0.7%	0.5%
Manufacturing	58	0.8%	1.2%	2.1%
TCPU	433	79.0%	76.5%	76.6%
Trade	447	7.4%	6.6%	5.7%
FIRE	456	2.3%	3.0%	5.7%
Services	463	9.4%	11.1%	8.4%
Government	510	0.3%	0.7%	0.8%
Institutions	516	0.3%	0.1%	0.0%
Other	30001	0.0%	0.0%	0.0%

*Excludes Sea-Tac International Airport.

Source: MIG, IMPLAN Professional Version 2.0 Social Accounting & Impact Analysis Software, 2nd Edition, June 2000.





Table 5.
Estimated Airport Operations Economic Impacts by Industry (Percent of Total)

Eastern Region				
Industry	IMPLAN Sector	Total Employment	Total Employee Compensation	Total Output
Agriculture	1	0.2%	0.1%	0.1%
Mining	28	0.0%	0.0%	0.0%
Construction	48	0.7%	0.6%	0.6%
Manufacturing	58	0.9%	1.0%	1.6%
TCPU	433	67.3%	78.3%	77.0%
Trade	447	11.8%	6.6%	5.8%
FIRE	456	4.0%	3.0%	5.8%
Services	463	14.3%	9.5%	8.4%
Government	510	0.5%	0.7%	0.7%
Institutions	516	0.4%	0.1%	0.0%
Other	30001	0.0%	0.0%	0.0%

Source: MIG, IMPLAN Professional Version 2.0 Social Accounting & Impact Analysis Software, 2nd Edition, June 2000.

Table 5.
Estimated Airport Operations Economic Impacts by Industry (Percent of Total)

North Central Region				
Industry	IMPLAN Sector	Total Employment	Total Employee Compensation	Total Output
Agriculture	1	0.3%	0.2%	0.4%
Mining	28	0.0%	0.0%	0.0%
Construction	48	0.3%	0.5%	0.6%
Manufacturing	58	0.5%	0.8%	1.6%
TCPU	433	86.8%	84.5%	76.5%
Trade	447	6.0%	5.8%	6.8%
FIRE	456	1.1%	1.2%	5.4%
Services	463	4.8%	6.3%	7.2%
Government	510	0.2%	0.7%	1.4%
Institutions	516	0.2%	0.1%	0.0%
Other	30001	0.0%	0.0%	0.0%

Source: MIG, IMPLAN Professional Version 2.0 Social Accounting & Impact Analysis Software, 2nd Edition, June 2000.

